Abstract 2724

Phenotypic testing of ceftriaxone susceptibility on the Pheno system in characterised Enterobacterales

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Background: Various methods to detect extended-spectrum beta-lactamase (ESBL) *Enterobacterales* are utilized by clinical laboratories. However, both CLSI and EUCAST support the use of current breakpoints for cephalosporins and aztreonam in lieu of ESBL testing as MIC is understood to be the *in vitro* predictor of clinical treatment outcomes for *Enterobacterales.* Despite *in vitro* activity, clinical data suggest the use of beta lactam/beta lactamse inhibitor combinations for bloodstream infections due to ceftriaxone (CRO) non-susceptible (NS) isolates as less favorable than definitive carbapenem therapy. Earlier detection of these organsims can help guide antibiotic therapy. The objective of this study was to compare the performance of the Accelerate PhenoTest™ (AXDX) CRO susceptibility to reference broth microdilution (BMD) for beta-lactamase producing *Escherichia coli, Klebsiella pneumoniae,* and *Proteus mirabilis.*

Materials/methods: 37 characterized *E. coli, K. pneumoniae,* and *Proteus mirabilis* isolates obtained from ARLG Virtual Biorepository, CDC Antibiotic Resistance Isolate Bank, and Accelerate Diagnostics frozen clinical isolate collection were utilized. Clinical and Laboratory Standards Institute (CLSI) broth microdilution (BMD) in triplicate was performed on each isolate as the reference method. The CLSI ESBL confirmatory disk test utilizing cefotaxime, cefotaxime plus clavulanate, ceftazidime, and ceftazidime plus clavulanate (BD Diagnostics Systems, Sparks, MD) was also performed in triplicate. Species identification and AST was also performed on the AXDX according to the manufacturer's instructions. CLSI 2019 breakpoints were used to assess interpretation.

Results: In a collection of primarily CRO resistant isolates (29/37, 78%) overall CRO categorical agreement (CA) of AXDX was 97.3% (36/37) compared with reference BMD due to 1 minor error. The CLSI ESBL disk test resulted in 1 false negative (ESBL + AmpC) and 1 false positive (original-spectrum beta lactamase (OSBL)) (Table 1).

	AXDX CRO CA (%)	BMD CRO NS	ESBL Disk Test
ESBL±AmpC (n=23)	95.6%	23/23	22/23 positive
OSBL+AmpC (n=6)	100%	6/6	0/6 positive
OSBL (n=8)	100%	0/8	1/8 positive

Conclusions: AXDX provided accurate detection of CRO susceptibility across a collection of isolates with various genotypes. ESBL production is highly correlated to CRO non susceptibility. Therefore, earlier phenotypic detection of CRO susceptibility may help expedite the optimization of antibiotic therapy.

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